UCRL-JC-120408 Abstract

Abstract Submitted
for the 1995 Annual Meeting of the
Division of Atomic, Molecular and Optical Physics
16-19 May, 1995 Toronto, Ontario Canada

Suggested title of session
in which paper should be placed
Multiphoton Ionization of Molecules

Phase Dependence of the Electron and Proton Emission Directions in Strong Field, 1ω-2ω Multiphoton Excitation of H_2^+* K. C. KULANDER LLNL, F. H. MIES NIST and K. J. SCHAFER UC SAN DIEGO - In a strong, short-pulsed laser field a molecule can either dissociate or ionize, depending on the partitioning of the absorbed energy between the electronic and nuclear degrees of freedom. If the exciting field is a combination of the laser and its second harmonic with a defined relative phase, control of the direction of the emitted particles becomes possible. Our calculations show that the electrons, produced in the Coulomb explosion of the molecular ion, tend to be emitted in the same direction as the protons that result from multiphoton dissociation. This propensity agrees with the recent measurements by Sheehy, Walker and DiMauro. Using a collinear model for this system, we can explicitly follow the time-dependent dynamics of excitation to try to understand the mechanism for this observation.

* This work was performed under the auspices of the U.S. Department of Energy by LLNL under contract W-7405-ENG-48.

Prefer Standard Session

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